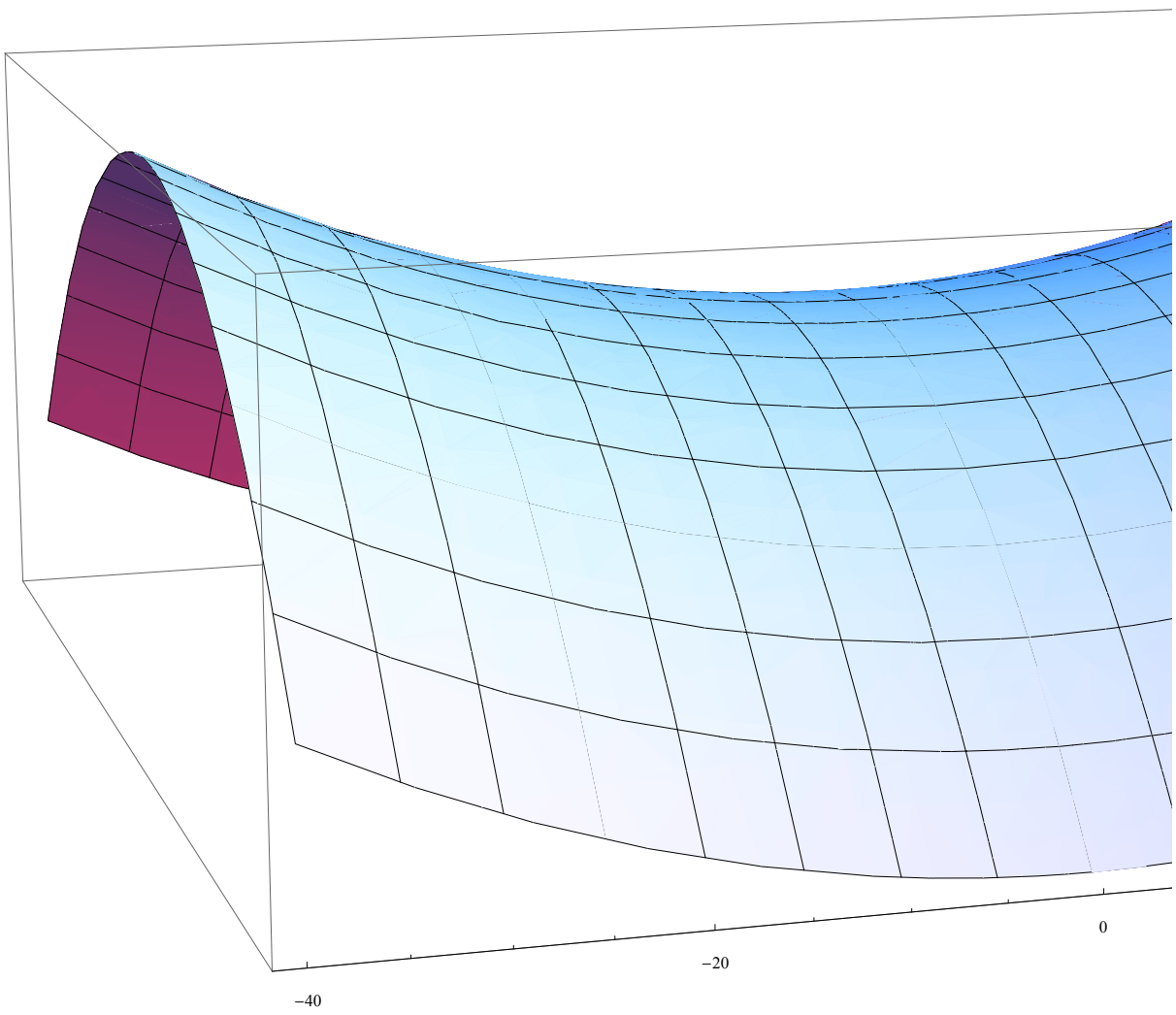
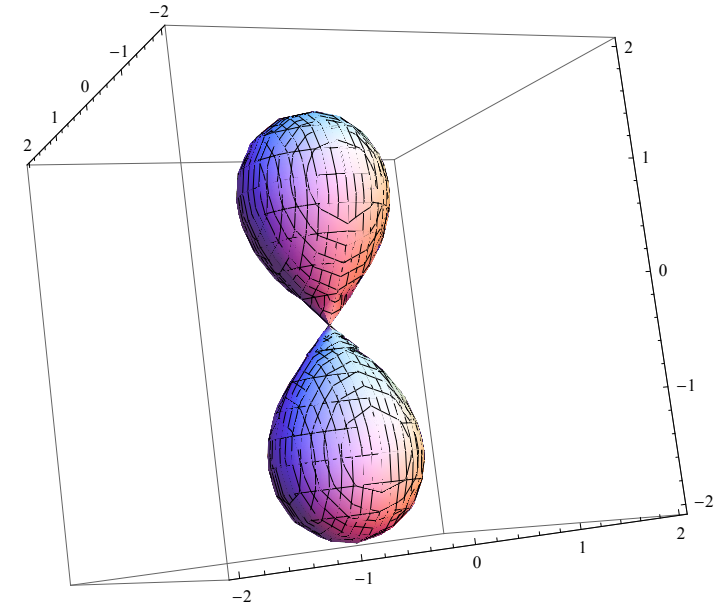
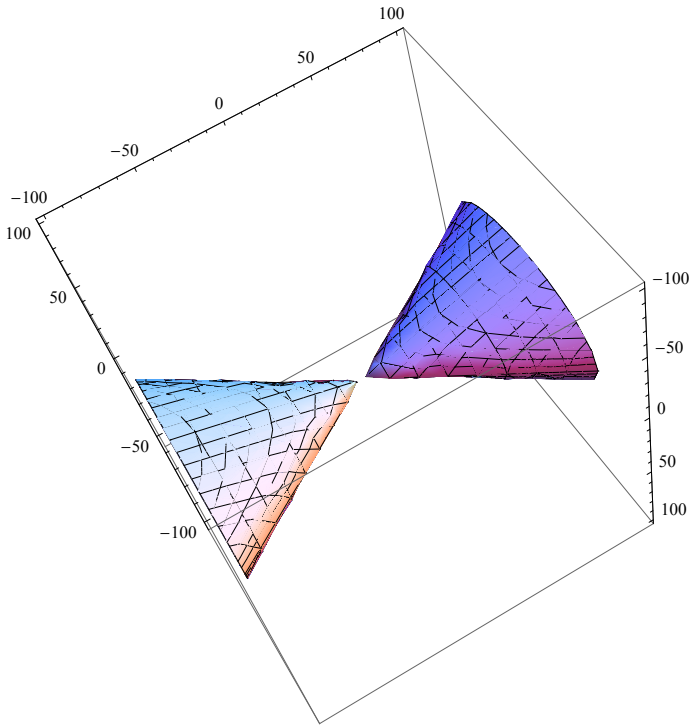
```
Plot3D[x^2 / 9 - y^2 / 4, {x, -40, 40}, {y, -40, 40}]
```

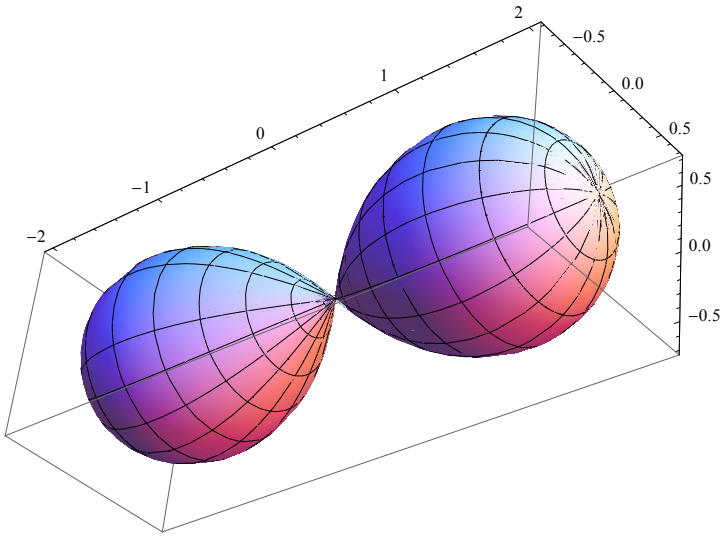


```
ContourPlot3D[(x^2 + y^2 + z^2)^2 - 4 (z^2 - x^2 - y^2) == 0,
 {x, -2, 2}, {y, -2, 2}, {z, -2, 2}]
```

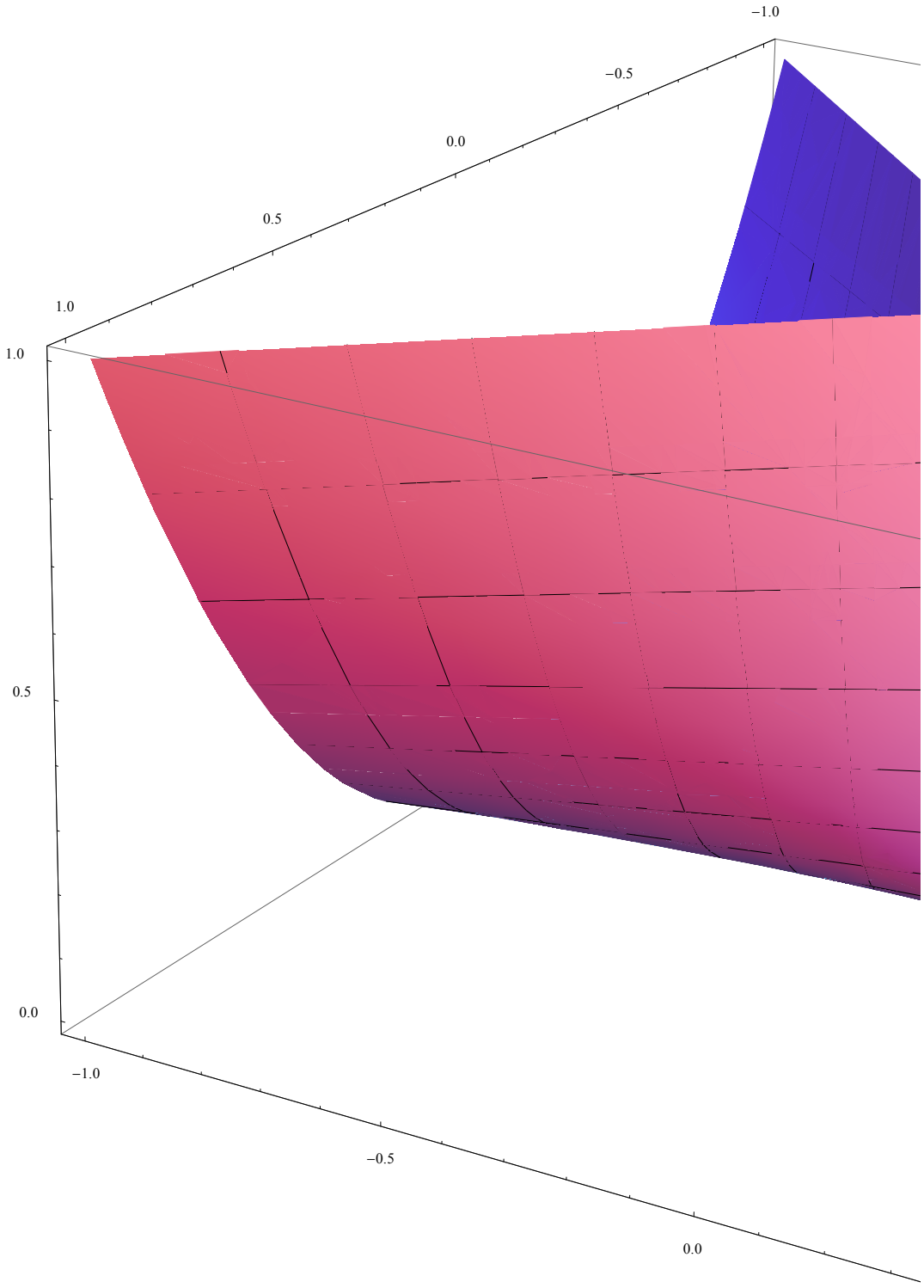




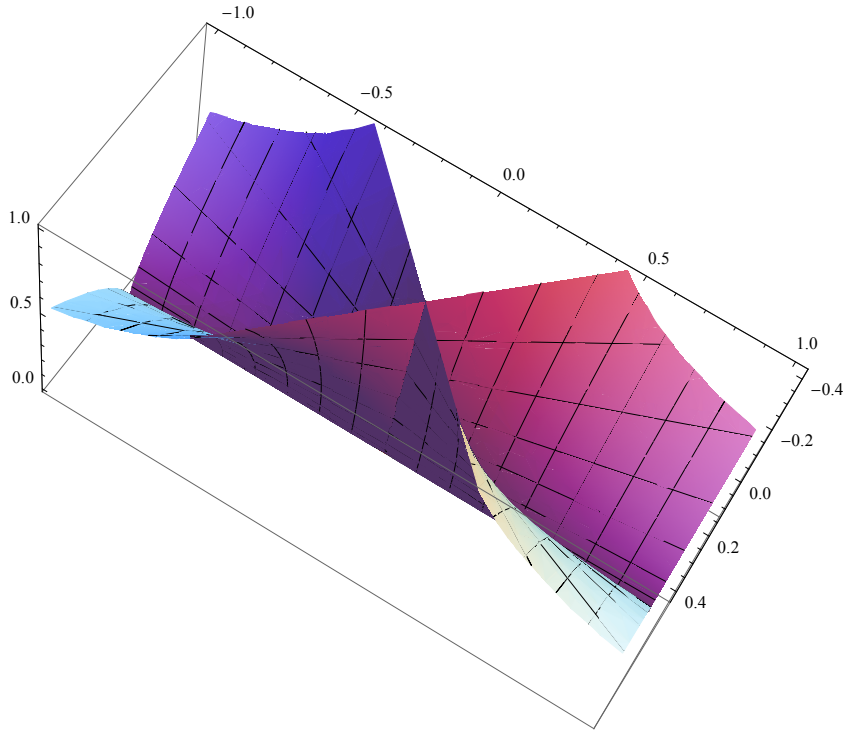
```
ParametricPlot3D[{2 Sin[u] * Cos[u] * Cos[v] / (1 + (Sin[u]) ^ 2),
  2 Sin[u] * Cos[u] * Sin[v] / (1 + (Sin[u]) ^ 2),
  2 Cos[u] / (1 + (Sin[u]) ^ 2)}, {u, 0, Pi}, {v, 0, 2 Pi}]
```



```
ParametricPlot3D[{u^2, u * v, v}, {u, -1, 1}, {v, -1, 1}]
```



```
ParametricPlot3D[{u, v^2, u * v^3}, {u, -1, 1}, {v, -1, 1}]
```




```
p[u_, v_] = {u, v^2, u * v^3}
```

$\{u, v^2, u\, v^3\}$

```
dpdu[u_, v_] = D[p[u, v], u]
```

$\{1, 0, v^3\}$

```
dpdv[u_, v_] = D[p[u, v], v]
```

$\{0, 2\, v, 3\, u\, v^2\}$

```
Jacp[u_, v_] = Transpose[{dpdu[u, v], dpdv[u, v]}]
```

$\{\{1, 0\}, \{0, 2\, v\}, \{v^3, 3\, u\, v^2\}\}$

```
MatrixForm[Jacp[u, v]]
```

$$\begin{pmatrix} 1 & 0 \\ 0 & 2\, v \\ v^3 & 3\, u\, v^2 \end{pmatrix}$$

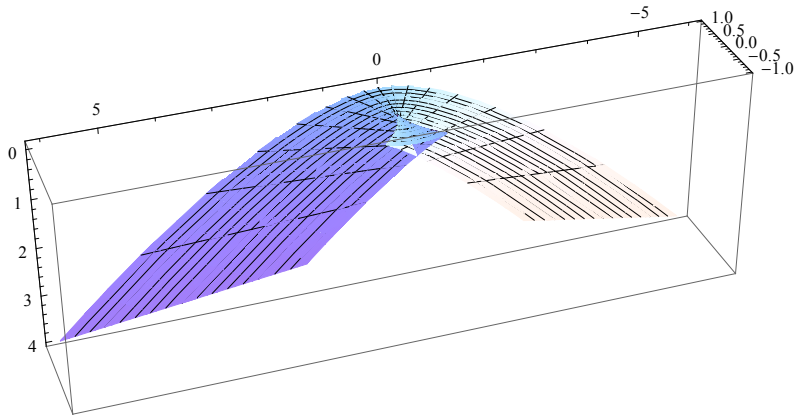
```
Det[{{1, 0}, {0, 2 v}}]
```

$2\, v$

```
Det[{{1, 0}, {v^3, 3 u v^2}}]
```

$3\, u\, v^2$

```
w1 = ParametricPlot3D[{3 u^4 + u^2 * v, 4 u^3 + 2 * u * v, v}, {u, -1, 1}, {v, -1, 1}]
```




```
q[u_, v_] = {3 u^4 + u^2 * v, 4 u^3 + 2 * u * v, v}
```

$$\{3\,u^4 + u^2\,v,\ 4\,u^3 + 2\,u\,v,\ v\}$$

```
dqdu[u_, v_] = D[q[u, v], u]
```

$$\{12\,u^3 + 2\,u\,v,\ 12\,u^2 + 2\,v,\ 0\}$$

```
dqdv[u_, v_] = D[q[u, v], v]
```

$$\{u^2,\ 2\,u,\ 1\}$$

```
Jacq[u_, v_] = Transpose[{dqdu[u, v], dqdv[u, v]}]
```

$$\{\{12\,u^3 + 2\,u\,v,\ u^2\},\ \{12\,u^2 + 2\,v,\ 2\,u\},\ \{0,\ 1\}\}$$

```
MatrixForm[Jacq[u, v]]
```

$$\begin{pmatrix} 12\,u^3 + 2\,u\,v & u^2 \\ 12\,u^2 + 2\,v & 2\,u \\ 0 & 1 \end{pmatrix}$$

```
Det[{{12 u^3 + 2 u v, u^2}, {0, 1}}]
```

$$12\,u^3 + 2\,u\,v$$

```
Det[{{12 u^2 + 2 v, 2 u}, {0, 1}}]
```

$$12\,u^2 + 2\,v$$

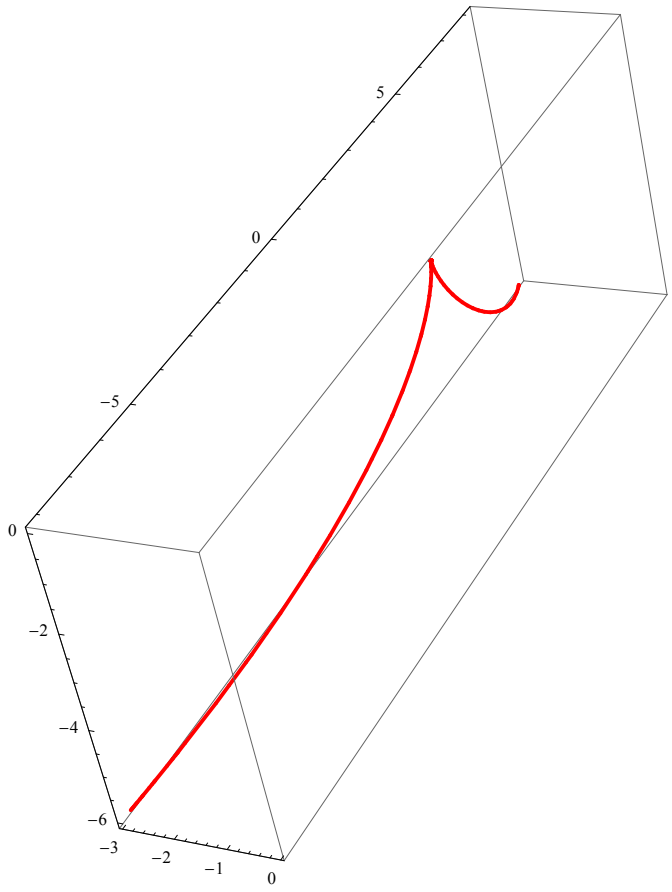
```
12 u^3 + 2 u v /. {v → -6 u^2}
```

```
0
```

```
q[u, -6 * u^2]
```

```
{-3 u^4, -8 u^3, -6 u^2}
```

```
w2 = ParametricPlot3D[{-3 u^4, -8 u^3, -6 u^2}, {u, -1, 1}, PlotStyle → {Red, Thick}]
```



```
Show[w1, w2]
```